



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,049	07/11/2003	Peter Mardilovich	200300109-1	5611
22879 7590 06/11/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER BAREFORD, KATHERINE A	
			ART UNIT 1762	PAPER NUMBER
			MAIL DATE 06/11/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/618,049

Applicant(s)

MARDILOVICH ET AL.

Examiner

Katherine A. Bareford

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 21-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 14, 2007 has been entered.

The Examiner notes that in the submission filed with the RCE of May 14, 2007, the claims were not amended, and thus, claims 1-20 remain pending in the state as last provided in the January 8, 2007 amendment, and claims 21-30 remain withdrawn from consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-4, 6-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson (US 6120588) in view of McCormack (US 4301196).

Jacobson teaches a method of forming metal patterns on a substrate. Column 9, lines 15-30. A pattern is decided for application. Column 9, lines 15-30. A metal composition is ink-jetted in the pattern. Figure 9A and column 9, line 60 through column 10, line 10 (the silver nitrate). A separate reducing agent composition with a reducing agent is also ink jetted in the pattern. Figure 9A and column 9, line 60 through column 10, line 10 (the aldehyde). The reducing agent contacts the metal composition and reacts with the metal salt to form a reduced metal. Figure 9A and column 9, line 60 through column 10, line 10 (by the process of "electroless plating"). While Jacobson describes silver nitrate plating, the reference teaches that many other chemistries known in the art of electroless plating can be used. Column 10, lines 1-5.

Claim 2: the metal can be silver, etc. Figure 9A and column 9, line 60 through column 10, line 10 (the silver nitrate).

Claim 4: the salt can be AgNO_3 . Column 10, line 1.

Claim 6: the reducing agent can include aldehyde. Figure 9A and column 9, line 60 through column 10, line 10 (the aldehyde).

Claim 12: the reducing agent is ink jetted on the pattern in a offset area with respect to the metal composition. Figure 9A. A portion of each material would not overlap each other due to the offset nature of their sprays.

Jacobson teaches all the features of these claims except (1) the electroless active layer (claim 1), (2) the specific reducing agent (claims 6-7), (3) the specific substrate (claim 8), (4) the heating (claim 9), (5) the multiple layers and depth (claims 10-11), (6) the initiator features (claims 13-18), (7) the circuit pattern (claim 20) and (8) that the metal composition includes a metal salt of palladium (claim 3).

However, McCormack teaches a method of applying an electroless copper plating. Column 3, lines 60-68. The surface can be pretreated with an initiator treatment, such as by depositing an electroless initiator of palladium and tin, to provide an electroless active layer. Column 6, line 50 through column 7, line 5. The pretreatment can be by immersing the substrate the initiator. Column 7, lines 1-5. The plating can use a composition with metal and reducing agent of formaldehyde or hydrazines, which is applied to the pretreated electroless active layer. Column 3, lines 60-65, column 5, lines 40-50 and column 6, lines 50-65. The substrate can be ceramics,

glass, polymers, etc. Column 7, lines 30-35. During treating the temperature can be 20-80 degrees C. Column 7, lines 20-30. The coating is to be applied until a desired thickness has been built up. Column 7, lines 5-10. McCormack teaches that the plating can be used to apply circuit patterns. Column 1, lines 25-50. The plating composition can be applied by immersion or spraying. Column 7, lines 5-10. The plating composition can include various metals from Group VIII of the periodic table including palladium provided as a metal salt, thus providing a metal salt of palladium would be applied on the substrate as part of the metal application. column 4, line 67 through column 5, line 10 and column 14, lines 20-55 (see the use of palladium chloride in the table).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson to use the conventional electroless plating features and materials taught by McCormack in the inkjet electroless plating process with an expectation of a desirable plated article being achieved, because Jacobson teaches a method of inkjet electroless plating that can be used with conventional electroless plating chemistry and McCormack teaches conventional electroless plating chemistry, including the use of an initiator layer of electroless active material, conventional reducing agents such as hydrazines, specific substrate materials, such as ceramics, specific materials desired to be plated, including palladium, the conventional heating of the compositions during application, the conventional materials and application of the initiator layer and the conventional deposition of the material to form

circuit patterns. As to the multiple applications to form layers of the desired depth, it would have been obvious to one of ordinary skill in the art to do so, given McCormacks teaching to provide the treatment until the desired depth has been reached, and one of ordinary skill in the art would optimize the depth based on the desired purpose of the coating to be applied. It further would have been obvious to deposit the initiator by ink jetting in a non-continuous pattern to correspond to the metal pattern to be applied so that the minimum amount of material can be used.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack as applied to claims 1-4, 6-18 and 20 above, and further in view of Japan 08-319575 (hereinafter '575).

Jacobson in view of McCormack teaches all the features of this claim except what palladium salt can be used.

However, '575 teaches that $\text{Pd}(\text{NH}_3)_4\text{Cl}_2$ can be used as the metal salt for an electroless deposition. Abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack to use $\text{Pd}(\text{NH}_3)_4\text{Cl}_2$ as the palladium salt when depositing palladium as suggested by '575 in order to provide a desirable palladium coating, because Jacobson in view of McCormack teaches electroless coating using conventional materials, and that palladium salts can be used,

and '575 teaches that $\text{Pd}(\text{NH}_3)_4\text{Cl}_2$ is a desirable metal salt for electrolessly depositing palladium.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack as applied to claims 1-4, 6-18 and 20 above, and further in view of Wells (US 3918927).

Jacobson in view of McCormack teaches all the features of this claim except the marring of the substrate.

However, Wells teaches that the application of activator solution of palladium chloride is performed in acidic environments. Column 11, lines 54-57. Wells also teaches that it is well known to prepare a surface for electroless coating by marring the surface by the etching with acid before coating. See column 3, lines 25-35 and 65-66 and column 11, lines 40-45.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack to mar the substrate by etching from acid as suggested by Wells in order to provide a desirable electroless coating, because Jacobson in view of McCormack teaches that an initiator coating with palladium can be applied and Wells teaches that when applying such a coating it is known to provide it in an acid environment which would further provide marring by etching from the acid and also teaches to further prepare the surface by etching with acid.

Response to Arguments

7. Applicant's arguments filed May 14, 2007 have been fully considered but they are not persuasive.

(A) As to the 35 USC rejection using Jacobson in view of McCormack, (1) applicant has argued that there is no advantage to be derived from the combination of Jacobson with McCormack, arguing that in the statement of Jacobson at column 9, line 67 through column 10, line 4 referring to "As an example . . . known in the art of electroless plating", the "other examples of chemistries" refers to other combinations of metallic traces and reducing agents, and does not teach of the need for seeking conventional electroless deposition systems, which Jacobson claims to have advantage over. The Examiner has reviewed this argument, however, the rejection is maintained. The Examiner would understand the plain meaning of "chemistries" as known in the art of electroless plating to indicate more than just metallic traces and reducing agents that can be used, as chemistries indicates the science of the composition, structures, properties and reactions of something, thus indicating a wide look at the field of electroless plating. Furthermore, at the very least, Jacobson indicates the desire to look outside of the confines of the patent to the known art of electroless plating. As well, one of ordinary skill in the art would look to the field of endeavor or reasonably pertinent areas. As previously discussed, McCormack provides a benefit from using an electroless active layer (sensitizing treatment) before the part of electroless plating where

Art Unit: 1762

metal salts and reducing agent are applied. (2) applicant further argues that the teaching of McCormack as to benefits of using an electroless active layer refer to etching, and Jacobson teaches away from etching. The Examiner has reviewed these arguments, however, she disagrees. To apply the sensitizing treatment, McCormack describes a treatment where stannous chloride followed by palladium chloride is applied, with no indication of the acidity or etching of this application (see column 6, lines 50-60). McCormack also describes the use of an acidic/stannous chloride/palladium chloride treatment, with no indication that it performs etching other than that the solution is acidic (see column 6, line 59 through column 7, line 5). In fact, a different acid treatment is described merely removing oxides from a surface (column 6, lines 65-69). Applicant argues that such an acid etching step is well known and is disclosed in the present invention. The Examiner disagrees. Applicant discloses at page 6, lines 22 through page 7, line 7 that an etching step to mar the substrate can be provided in lieu of, or in addition to, depositing a metal seed, which implies that the sensitizing step alone will not etch. However, even if the sensitizing step in acid provides a degree of etching, Jacobson still does not teach away from this step. The Examiner notes that Jacobson teaches that processes shown in figures 7-9 provide for "... depositing metals, resistive materials or semiconductive materials outside of vacuum, in an arbitrary pattern, with out the need for an etch step ..." (column 9, lines 24-27) and in the Summary of the Invention that the invention provides for "... printing said inks in an arbitrary pattern onto a large class of substrates without the requirements of

standard vacuum processing or etching.” (column 1, lines 49-53). However, the etching step of Jacobson is not an etching that would be provided by a sensitizing process. In the Background of the Invention, where Jacobson first describes the “vacuum processing” and “etching”, Jacobson states “In the area of flat panel display drives there exists technology for laying down logic elements onto glass by means of vacuum depositing silicon or other semiconductive material and subsequently etching circuits and logic elements. Such a technology is not amenable to laying down logic elements onto an arbitrary surface due to the presence of the vacuum requirement and the etch step.” (column 1, lines 20-27). Thus, when looking at the context of terminology that Jacobson uses, including the combination of “application of arbitrary patterns”, “vacuum processing” and “etching”, it is clear that Jacobson is referring to the process as allowing the production of arbitrary patterns during application without having to apply material and then etching the material to form the desired pattern after application. Therefore, Jacobson clearly does not teach away from a pretreatment activation pattern to enhance adhesion to the substrate.

(B) As to the further rejection of claim 19 using Jacobson in view of McCormack and further in view of Wells, the Examiner has reviewed applicant’s arguments, however, the rejection is maintained. The Examiner again notes that Wells also, at the least, teaches a specific etching step that mars the substrate with acid separately to applying the activator solution of palladium chloride that helps prepare the surface for plating. See column 3, line 25-45, and column 3, line 55 through column 4, line 10 (note

the sequence of steps). As well, if the acid process of McCormack provided "etching", as argued by applicant in section (A) above, it would appear that the process of Wells would also do so, and therefore mar. Jacobson would not teach away from this pretreating process for the same reasons as discussed with regard to the "etching" in section (A) above.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER